

# Layered shutters for volumetric display

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A volumetric display system 20 includes a display member 22 which has a plurality of electrically responsive optical shutters 26A - 26N arranged in a layered relationship. A projection system 24 projects successive images onto the display member while successive selected ones of the optical shutters are switched into their translucent state. At any moment in time all optical shutters except the selected one are maintained in a transparent state. Preferably the optical shutters comprise layers (28, Figure 2A) of polymer dispersed liquid crystal separated by transparent electrodes (32) formed from indium oxide, tin oxide or indium-tin oxide. Each liquid crystal layer may have respective pairs of electrodes with adjacent electrodes separated by a transparent layer (34, Figure 2B) of silicon dioxide. The projection system may comprise a respective display for each solid angle of display, or a plurality of projectors may sequentially project onto the whole display. The system is advantageously used in air traffic control displays, when the liquid crystal layers may be hemispherical, and in MRI when the layers may be planar.

